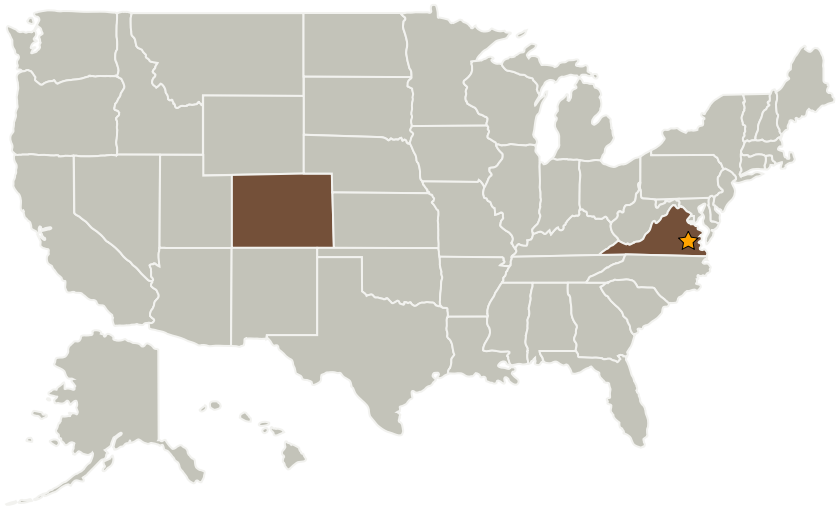
Electro-Optic Imaging Fourier Transform Spectral Polarimeter, Phase I

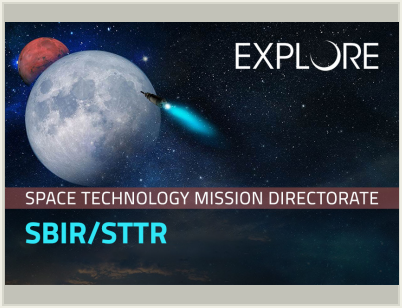
Completed Technology Project (2004 - 2004)

Project Introduction

Boulder Nonlinear Systems, Inc. (BNS) proposes to develop an Electro-Optic Imaging Fourier Transform Spectral Polarimeter (E-O IFTSP). The polarimetric system is based on BNS? patented FTS technology, where ferroelectric liquid crystal (FLC) polarization switches control device operation. The designed system has simple drive/calibration requirement, and the capability to acquire complete Stokes polarization information simultaneously with the spectral imaging information. This information is collected using short data acquisition times due to the fast electro-optic tuning (sub-millisecond response for FLC switches) and the high optical throughput of the spectrometer. The spectral region of interest is the 0.5 ? 1.5 micrometers to allow high-resolution, high-speed measurement of a large number of different atmospheric aerosols. Our approach uses non-moving parts in a compact geometry, which is expected to produce a simple and reliable system needed for critical NASA missions. The compact, low-mass E-O IFTSP will be particularly suitable for use on small aircraft platforms to advance capability in the spectral imaging polarimetry of aerosols and clouds in Earth?s atmosphere, and for integrating into Earth orbiting satellites for long-duration monitoring of atmospheric trace gases.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Boulder Nonlinear Systems, Inc.	Supporting Organization	Industry	Lafayette, Colorado

Primary U.S. Work Locations	
Colorado	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigators:

Xiaowei Xia
Marc Christophersen

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers